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MAJOR FRANK B. ROGERS, MC

Historical Division

Frank B. Rogers

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Malaria Control, Hq LUBSEC, APO 358

25 Feb 1945

AN ERROR WAS MADE

Captain Charles H. Daniels, Sn C, CO of the 41st MSU, has called our attention to an error made in our compilation of Hookworm surveys. His letter is self-explanatory and thereby quoted:

"1. Attention is invited to the compilation of Hookworm surveys in the Malaria Newsletter of 25 December 1944. It is stated that the 41st Malaria Survey Unit examined 124 stools, of which 59 (47.5%) were positive.

"2. As reported by the 41st Malaria Survey Unit (see par 5 of September Report, below), the figures in paragraph 1 should read: of 124 stools examined, 106 (85.5%) were positive for hookworm. In compiling the Newsletter report, no cognizance was taken of 47 mixed infections which contained hookworm (par 5b (1) (c)).

"3. Excerpt from paragraph 5 of September report of the 41st Malaria Survey Unit:

5. *****

a. *****

b. Stools

124

(1) With helminth infection

118

(a) Hookworm

59

(b) Trichuris

12

(c) Hookworm and Trichuris

47"

Survey Units in the Philippines.

Some units are sending in maps showing only Anopheline and Culicine breeding places on Luzon and Leyte. Because of the variety of Anophelines and their variability of infectivity it is necessary to differentiate the species. Please see that this is carried out, otherwise the results are useless and make much useless work for the control units.

Malaria rates per/1000/annum for the month of January 1945 for Leyte and Mindoro are as follows:

	Leyte		Mindoro
	US/SOS	5th AF	5th AF
Week Ending Jan 5	63.2	3.0	14
" " " 12	39.2	7.0	23
" " " 19	36.1		58
" " " 26	33.3		43

A report rendered by the 5th MSU states: "The most interesting discoveries have been collections of a species of Hodgesia and a species of Harpogomyia, both of them unusual genera of mosquitoes." These two species were collected on Leyte.

Surveys for Schistosoma japonicum and other Helminths in the Palo-Tacloban Sectors was made by Lts Herbert C. Barnett and Floyd A. Holmes and the men of the 211th MSU during the month of January 1945. The following information is extracted from their report of the results of this survey.

Poblacion Tacloban.

The city (poblacion) of Tacloban had a population of 19,048 as indicated by the census of January 1939. The population at present, exclusive of military personnel, appears to be close to this figure. Four hundred and ninety-four (494) stools were examined from civilians in Tacloban.

Seven cases of schistosomiasis were discovered in this survey. All schistosome cases were carefully interrogated to determine the time of onset of symptoms and the place of exposure. The first, a girl of sixteen (16), gave a history indicating that the infection was acquired in Palo. The second, a boy of fourteen (14), gave a similar history that the disease was contracted in Palo. The third, a girl of ten (10), the fourth, a male of nineteen (19), and the fifth, a male of seventeen (17), all gave histories indicating the disease was contracted in Pastrana. The sixth, a male of twenty (20), was demonstrated to have acquired the infection at Alangalang. The seventh, a male of thirty-nine (39), appears to have acquired the infection in the barrio of Pawing. (See discussion of case "Barrio Pawing", 2nd par.) There were no cases of schistosomiasis which could be traced to the poblacion of Tacloban as the point of origin. Palo, Pastrana, and Alangalang are known endemic areas.

Results of the survey for other helminths, together with additional information on the schistosomiasis cases have been indicated in the following table:

AGE GROUP	: 0-5	: 6-10	: 11-20	: 21-40	: 41-over	: TOTALS	: Fili	: Chin	: Male	: Fel
	:	:	:	:	:	:	: pino	: ese	:	: male
HOOKWORM	: 6	: 11	: 45	: 31	: 19	: 112	: 106	: 6	: 66	: 46
TRICHURIS	:	:	:	:	:	:	:	:	:	:
TRICHURA	: 37	: 41	: 76	: 85	: 39	: 278	: 260	: 18	: 135	: 143
ASCARIS	: 74	: 53	: 91	: 99	: 45	: 362	: 336	: 26	: 175	: 187
STRONGY-	:	:	:	:	:	:	:	:	:	:
LOIDES	: 0	: 0	: 1	: 0	: 0	: 1	: 1	: 0	: 0	: 1
SCHIST*	:	:	:	:	:	:	:	:	:	:
OSOMA	:	:	:	:	:	:	:	:	:	:
JAPONICUM	: 0	: 1	: 5	: 1	: 0	: 7	: 7	: 0	: 5	: 2

All rivers, streams, ponds, swamps, and other collections of water failed to yield any specimens of Oncomelania hydrobiopsis in the poblacion of Tacloban and surrounding areas. This area was worked over very carefully twice in an effort to discover Oncomelania, but entirely with negative results.

Barrio Pawing.

The barrio of Pawing had a population of 1,063 according to the 1939 census. The present population is fairly close to this figure. A total of ninety-three (93) stools were collected and examined from this barrio.

Five cases of schistosomiasis were discovered in Pawing, all occurring in males. The first was a boy of eight (8) who has never left the barrio. Onset of symptoms was in December 1943, shortly before which he had done considerable fishing and playing in submerged fields behind his home. The second case, a man of twenty-four (24) also indicates a history of having acquired the disease in Pawing, although the onset of symptoms could not be determined definitely. The third, a man of forty-five (45), and the fourth, a man of thirty-four (34), both give a history of having acquired the disease during a fishing trip in Pawing. They had been fishing with a third man (picked up independently as a positive schistosome in Tacloban) approximately one year ago, when all noticed upon emerging from the water, a severe itching over the greater part of the body. All three men engaged in the fishing trip were found positive for schistosomiasis.

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The fifth case, a man of fifty-seven (57), gave a history indicating that his infection was acquired in the barrio of San Antonio, a known endemic area.

The entire barrio of Pawing was surveyed twice for Oncomelania with completely negative results. In addition, spot checks were made in the areas where it was believed the positive cases had acquired the infection, but the results continued to be negative. The survey for snails was conducted here at approximately the same time of the year as the positive cases appeared to have acquired the infection.

Results of the survey for other helminths have been indicated in the following table.

AGE GROUP	0-5	6-10	11-20	21-40	41-over	TOTALS	Male	Female
HOOKWORM	10	8	5	22	18	63	31	32
TRICHURIS								
TRICHURA	21	10	5	25	17	78	35	43
ASCARIS	25	11	7	27	18	88	44	44
STRONGY-LOIDES	0	0	0	0	0	0	0	0
SCHIST-OSOMA								
JAPONICUM	0	1	0	2	2	5	5	0

Results of the examinations for helminths are indicated in the following table for the Barrio of San Jose.

AGE GROUP	0-5	6-10	11-20	21-40	41-over	TOTALS	Male	Female
HOOKWORM	5	6	8	6	2	27	13	14
TRICHURIS								
TRICHURA	10	11	9	8	6	44	18	26
ASCARIS	16	8	11	12	6	53	21	32
STRONGY-LOIDES	0	0	0	0	0	0	0	0
SCHIST-OSOMA								
JAPONICUM	0	0	0	0	0	0	0	0

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The following extract is from a more recent report of the 211th MSU.

"A complete survey of this area (Tacloban and the barrios on Highway No. 1 between Tacloban and the Palo River) was made, and no specimens of O. hydrobiopsis were found. There were, however, four persons in the barrio of Pawing, whose stool specimens were positive for S. japonicum. In the histories of the cases, they gave very convincing evidence that their infections must have been acquired in the barrio of Pawing. An exhaustive search was again made in this area for O. hydrobiopsis. When no specimens of this genus could be found, our attention was turned to the possibility of another snail host. Collections of large numbers of Melania spp were made in the approximate areas in which these cases were supposedly contracted. Five hundred and sixty (560) of these snails were dissected and seven (7) were found to be infected with fork-tailed cercariae. Upon careful examination, it was concluded that this was the cercariae of S. japonicum. Specimens of the types of snails in which the infection was found are being sent away for identification. Further work on this problem is to be carried on by this organization.

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PARASITOLOGICAL SURVEY

by

425th Medical Composite Unit (MS)

A parasitological survey was conducted from 20 January to 24 January 1945, inclusive, on the patients applying to the PCAU #3 Dispensary at Manaoag, Pangasinan. Blood smears were made of both sick and injured persons, and also of apparently healthy members of their families in some cases. Hence the results given below cannot be taken as an indication of the rate of malaria in the population at large, but they do show the number of persons presenting themselves for treatment, the types of malaria encountered, and the gametocyte rates among infected persons.

A total of 201 persons were examined, 93 from Manaoag Poblacion, 84 from different barrios in Manaoag Municipality and 24 from other towns.

RESULTS OF BLOOD EXAMINATIONS -- Total

			POSITIVE											
			Total		Pf		Pv		Pm		Pf- Pv		PSU	
		:No. Exam	: No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0 - 5 yrs	M	14	3	21	2	67	1	33						
	F	13	5	38	1	20	4	80						
6 - 15 yrs	M	31	11	35	3	27	6	55			2	18		
	F	27	8	30	4	50	3	38					1	12
over 15 yrs	M	78	30	38	19	63	7	23			1	3	3	10
	F	38	9	24	3	33	4	45					2	22
Total														
0 - 5 yrs		27	8	30	3	38	5	62						
6 - 15 yrs		58	19	33	7	37	9	47			2	11	1	5
over 15 yrs		116	39	34	22	56	11	28			1	3	5	13
Total	M	123	44	36	24	55	14	32			3	7	3	7
	F	78	22	28	8	36	11	50					3	14
GRAND TOTAL		201	66	33	32	48	25	38			3	5	6	9

GAMETOCYTE RATES

	Pf			Pv.			Total		
	No.	No.	%	No.	No.	%	No.	No.	%
	Pos.	Gam	Gam	Pos	Gam	Gam	Pos	Gam	Gam
0 - 5 yrs									
Manaoag, Poblacion	1			2			3		
Baritao, Man.				1			1		
Inmandoyan, Man.	1						1		
Sapang, Man	1						1		
Tebuel, Man				2	2	100	2	2	100
Other Barrios, Man*									
Total Manaoag, Man	3			5	2	40	8	2	25
Other Towns***									
Total 0-5 yrs	3			5	2	40	8	2	25
6 - 15 yrs									
Manaoag Poblacion	3	2	67	7			10	2	20
Baritao, Man									
Inmandoyan, Man	3	1	33	1			4	1	25
Sapang, Man	1	1	100				1	1	100
Tebual, Man	1			2	2	100	3	2	67
Other Barrios, Man*				1	1	100	1	1	100
Total Manaoag, Mun	8	4	50	11	3	27	19	7	37
Other towns **	1						1		
Total 6 - 15 yrs	9	4	44	11	3	27	20	7	35

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GAMETOCYTE RATES (Cont'd)

	Pf			Pv			Total		
	No.	No.	%	No.	No.	%	No.	No.	%
	Pos.	Gam	Gam	Pos	Gam	Gam	Pos	Gam	Gam
Over 15 yrs									
Manaoag, Poblacion	9	5	56	3			12	5	42
Baritao, Man.	1	1	100	3	1	33	4	2	50
Inmandoyan, Man.	4	3	75				4	3	75
Sapang, Man.	2	1	50				2	1	50
Tebual, Man.	2			3	1	33	5	1	20
Other Barrios, Man *	4			2	2	100	6	2	33
Total Manaoag Mun.	22	10	45	11	4	36	33	14	42
Other towns **	1			1	1	100	2	1	50
Total over 15 yrs	23	10	43	12	5	42	35	15	43
Male									
Manaoag, Poblacion	11	7	64	7			18	7	39
Baritao, Man.	1	1	100	1			2	1	50
Inmandoyan, Man.	6	2	33	1			7	2	29
Sapang, Man.	3	1	33				3	1	33
Tebuel, Man.	2			4	2	50	6	2	33
Other Barrios, Man *	3			3	3	100	6	3	50
Total Manaoag, Mun.	26	11	42	16	5	31	42	16	38
Other towns **	1			1	1	100	2	1	50
Total Males	27	11	41	17	6	35	44	17	39
Female									
Manaoag, Poblacion	2			5			7		
Baritao, Man.				3	1	33	3	1	33
Inmandoyan, Man.	2	2	100				2	2	100
Sapang, Man.	1	1	100				1	1	100
Tebuel, Man.	1			3	3	100	4	3	75
Other Barrios, Man *	1						1		
Total Manaoag, Mun.	7	3	43	11	4	36	18	7	39
Other towns **	1						1		
Total Females	8	3	38	11	4	36	19	7	37
TOTAL									
Manaoag, Poblacion	13	7	54	12			25	7	28
Baritao, Man.	1	1	100	4	1	25	5	2	40
Inmandoyan, Man.	8	4	50	1			9	4	44
Sapang, Man.	4	2	50				4	2	50
Tebuel, Man.	3			7	5	72	10	5	50
Other Barrios, Man. *	4			3	3	100	7	3	43
Total Manaoag, Mun.	33	14	42	27	9	33	60	23	38
Other towns **	2			1	1	100	3	1	33
GRAND TOTAL	35	14	40	28	10	36	63	24	38

* Babasit, Cabambanan, Laoac, Lipit, Maraboc, Nalsian, Pantal, Santa Ines, Talogtos, Uraan, Calmay.

** Baguio, Binalonan, Dagupan, Lingayen, Manila, Pozorrubio, San Carlos.

RESULTS OF BLOOD EXAMINATIONS -- Manaoag School Children

	POSITIVE							
	No. Exam	Total		Pf		Pv		PSU
		No.	%	No.	%	No.	%	
MALES								
Manaoag, Poblacion	25	2	8			1	50	1 50
Baritao, Man.	15	2	13	2	100			
Iicsi, Man	7	1	14			1	100	
Pantal, Man.	16							
Sapang, Man.	6							
Tebuel, Man.	9	1	11			1	100	
Other barrios Man*	13							
Total Male	91	6	7	2	100	3	50	1 17

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RESULTS OF BLOOD EXAMINATIONS -- Manaoag School Children (Cont'd)

	No. Exam	POSITIVE											
		Total		Pf		Pv		Pm		Pf - Pv		PSU	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
FEMALES													
Manaoag, Poblacion	36												
Baritao, Man.	9	1	11			1	100						
Licsi, Man.	8												
Pantal, Man.	15												
Sapang, Man.	7												
Tebuel, Man.	8												
Other barrios Man*	20												
Total Females	103	1	1			1	100						
TOTAL													
Manaoag, Poblacion	61	2	3			1	50					1	50
Baritao, Man.	24	3	12	2	67	1	33						
Licsi, Man.	15	1	7			1	100						
Pantal, Man.	31												
Sapang, Man.	13												
Tebuel, Man.	17	1	6			1	100						
Other barrios, Man*	33												
Total	194	7	4	2	29	4	57					1	14

* Babasit, Cabamangan, Calaoacan, Calmoy, Inmandoyan, Lipit, Nalsian, Pao, Parian, Santa Ines, Uraan, Zamora.

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COMMANDING OFFICERS ALL MALARIA UNITS

Only once in two years has it been necessary to mention malaria cases among malaria control and survey personnel. In the past three months certain cards have come to my attention of malaria personnel in the hospital with malaria.

This is a direct reflection on the efficiency of the commanding officers. It is your duty to see that your men take one atabrine tablet each and every day.

G. L. ORTH
Chief Malariologist

The 37th MSU commanded by Captain Carl G. Kadner, Sn C, during the month of January started several interesting experiments which are quoted for the information and guidance of all.

"In addition experiments are in progress to test the efficacy of a control measure used by the 25th Australian Malaria Control Unit. This procedure consists of soaking blocks of plaster of Paris (approximately 1"xl") in a 5% DDT oil solution and dropping these into small permanent collections of water. The blocks are prepared by mixing 2 pints sawdust, 1 pint plaster of Paris and one pint water. If a sufficient quantity of the oil is expressed over a period of days, this methods would offer a simple and practical method to control certain areas.

"A plunger type oil can (Ordnance No. 13-0-900 Oiler, steel, pump, 9" spout, 1 pint, Type II) is being experimented with as a dispenser for the efficient and economical application of DDT solution. The can squirts a fine stream approximately 12 feet. It is easy to carry and does not leak."

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The tables below were extracted from a Malaria Survey report of the Municipality of Zumarraga, Samar, Philippine Islands. This work was done by the 28th Malaria Survey Unit under the command of Captain Harry E. Brown, Sn C.

Results of 130 Blood Film Examinations, Zumarraga,
Buad Island.

Species of Parasite	Number of Positives	Percent Positive
<u>P. vivax</u>	27	20.79
<u>P. falciparum</u>	14	10.78
Mixed infection Both species	2	1.54
Total	43	33.11

Results of 64 Correlated Blood Examinations and Spleen Palpations on Individuals ranging from 1 - 16 Years.

Parasites	Spleen Palpations						Total Parasites
	Negative	1	2	3	4	5	
Negative	8	10	7	7	6	4	42
<u>P. falciparum</u>	4	2*	1	1	1	0	9
<u>P. vivax</u>	2	3	2	2	2	2	13
Total Spleens	14	15*	10	10	9	6	64

Spleen Positive 50

Spleen Rate: $50/64 \times 100 = 78$

Parasite Rate: $22/64 \times 100 = 34$

Average Enlarged Spleen: $131/50 = 2.6$

Average Spleen: $131/64 = 2.0$

* Included here was one mixed infection of P. falciparum & P. vivax.

Comparison of spleen rate and parasite rate in relation to age, Zumarraga, Buad Island. (Spleen examinations made with individuals in standing position).

Age	No. Exam.	Percent Palpable Spleens	Average Enlarged Spleen	Average Spleen	Percent Parasite Positive
1-5	16	62.0	1.4	0.87	33
6-10	34	81.6	2.6	2.10	32
11-16	14	85.2	2.0	1.70	33

Species of Anopheles listed by locality and habitat.
Buad Island.

Locality	Habitats			
	Standing Ground Water	Seepage Areas	Grassy Running Water	Rock Pool
Zumarraga	<u>A. maculatus</u> <u>A. kochi</u> <u>A. ludlowii</u>	<u>A. maculatus</u>	<u>A. maculatus</u>	----
Macalonud	----	<u>A. maculatus</u>	----	<u>A. maculatus</u>
Mualbual	----	<u>A. maculatus</u>	<u>A. maculatus</u> <u>A. tessellatus</u>	

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Present Status of Schistosomiasis - 25 January 1945.

by

Captain D. Kirkham, M.C.

1. Incidence: Schistosomiasis is known to be endemic in Leyte in pre-war times. Recent surveys reveal over 20% infection in the civilian population in many areas. The whole of Leyte valley appears to be involved with the possible exception of the Carrigara area. The disease is not known to exist on the west coast or in the mountainous regions. Early in January, 1945, the first cases began to appear in military personnel, and the number increased steadily. At present there are 85 cases with ova in the stool hospitalized here. A few diagnosed cases were evacuated, and some other evacuees were later found to have the disease at other bases; these are not included in the above figure. Also some men exposed here and subsequently sent to Mindoro have come down with the disease there. In addition there are many cases in this base which strongly suggest schistosomiasis clinically but whose stools are not positive for ova - they are being watched closely, and some of them are being treated.

2. Epidemiology:

a. The 50th Engineer Battalion was the first unit involved, and study of their epidemic has been made by Major Sullivan of the 8th Army Surgeon's Office and Captain Ferguson of the 5th Malaria Survey Unit. 45 proved cases had occurred by 15 January and many more were suspected. Blood smears on two companies revealed that 50% of the men had an eosinophilia of over 10%, and 10% of them were over 30%. The influence of hookworm infection on these figures is not yet clear; stool surveys are in progress. The patients had all been working in water on road construction near Terragona.

b. The 51st Portable Surgical Hospital had eight cases, all of whom went swimming on one occasion only in a river near the site of infection of the 50th Engineers and had no other history of exposure; no other cases have occurred in this unit. One of these patients died.

c. Nine cases with one death occurred in two companies of the 381st Infantry which had been in combat in heavily infected swampy country near Dagami.

d. Seven cases have been found in the 118th General Hospital detachment. These men had been exposed in the Guinarona River but not elsewhere.

e. In addition, scattered cases have been found in a number of USASOS and 8th Army units, and in some FEAF units. All these give a history of having been exposed to water in Central Leyte Valley, but other parts of the island are expected to be incriminated as the study progresses. Due to the long incubation period, a lag of at least a month between adequate control measures and a reduction in incidence is expected, and the rates will probably continue to rise for the next few weeks.

f. In all the areas where troops appear to have contracted the disease the civilian population had been found infected on stool surveys. Dogs in these places are also heavily infected, but other domestic animals have not been found positive.

g. Snails containing cercariae have been found in most of these places and in many others. They have not been found in the river where the 51st Portable Surgical Hospital went swimming, nor in the Guinarona River. It may be that some other snail than *Oncomelania hydrobiopsis* is carrying the disease, or that the cercariae are able to travel much further down a stream than was supposed. Intermittent overflow of rice paddies into rivers after rains may be responsible. Work is being done by Captain Ferguson on these problems. For purpose of control the whole island is considered as infested.

3. The clinical picture is being studied in several hospitals and reports on it are in preparation. In two autopsied cases which had received some treatment the adult worms were found to have all been killed, though the liver was loaded with ova. This suggests that tartar emetic is an effective drug if given early enough. The clinical picture of urticaria, daily fever is frequently present before the stool becomes positive for ova.

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The following information is extracted from "Health and Disease in Borneo, Celebes, The Moluccas and Lesser Sunda Islands" published by Training Aids Division, Office of the Assistant Chief of Air Staff, Training Headquarters Army Air Forces.

Borneo:

Borneo, the world's third largest island (282,000 square miles), is about ten times the size of Ireland. The mountainous interior, with peaks up to 13,500 feet, is covered with tropical rainforest. Mountain streams are numerous, but often run in inaccessible gorges. Rolling alluvial plains, crossed by broad winding rivers, are predominantly jungle-covered. Scattered swampy grasslands are found chiefly in central and southern Borneo. The coastline is mostly mangrove and nipa palm swampland; sandy beaches and rugged headlands are infrequent.

Rice is the main food product; it is intensively cultivated for two or three year periods in burned-off forest areas which are afterwards abandoned to secondary scrub jungle growth.

Mean temperature along the coast range from 78° F. to 86° F. with little monthly variation. The humidity is continuously high.

Malaria:

Malaria is prevalent in almost all regions below 4000 feet elevation. There is a high rate of transmission throughout the year, with notable rises in incidence at the beginning of and after the heaviest rains. Vivax and falciparum malaria are about equally common, and mixed infections are frequent; quartan malaria is common in Bali and occurs irregularly elsewhere.

(1) Vectors

A wide variety of anopheline species transmit malaria in these islands. Success in malaria prophylaxis will depend not only on species control but also on careful avoidance of creating favorable conditions for substitute vectors.

MALARIA VECTORS

Anopheline	Borneo	Celebes	Lesser Sundas	Habits
<u>A. sundaicus</u>	south coast	coasts	coasts	Sunlight; brackish coastal swamps, trapped lagoons, brackish streams, salt fish ponds. Surface vegetation required.
<u>A. subpictus</u>		southwest peninsula		Sunlight; fresh or brackish water. Pools, swamps, streams, and drains.
<u>A. minimus</u>		northeast peninsula		Sunlight; foothills. Running water, rice fields, fresh water ponds.
<u>A. aconitus</u>		northeast peninsula	Bali Sumba	Partial shade; plains and mountains. Rice fields, fish ponds, neglected ditches, and small brooks.
<u>A. hyrcanus</u>	east	southwest and west		Partial shade; inland swamps especially. Also rice fields, neglected irrigation ditches, borrow pits, and slow streams.
<u>A. maculatus</u>	east		hills	Sunlight; hills and mountains. Fast running streams, wells.

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MALARIA VECTORS (Cont'd)

Anopheline	Borneo	Celebes	Lesser Sundas	Habits
<u>A. umbrosus</u>	east and west			Shade; inland fresh water marshes, coastal brackish swamps.
<u>A. leucosphyrus</u>	east and north			Shade; pools, springs, puddles and swamps in deep forests.
<u>A. barbirostris</u>		central mountains and coast		Sunlight or shade; fresh water clear or stagnant. Rice fields; also slow rivers, ponds, mar- shes, ditches.
<u>A. punctulatus</u> <u>var. moluccensis</u>				Sunlight; fresh or brackish, clear or polluted, stagnant or flowing water. Natural or ar- tificial collections of water.
<u>A. punctulatus</u> <u>punctulatus</u>				Sunlight; artificial collectio of water, clear or turbid (ruts, footprints, gutters, water tanks, etc.)

When the tactical situation prohibits the carrying out of larval control measures, reliance must be placed upon a combination of personal prophylactic measures against the adult mosquitoes and upon atabrine suppression.

Anti-larval measures should be carried out as soon as the tactical situation permits. DDT should be used as a larvicide in a manner appropriate to the type of breeding place and as liberally as supplies permit. The clearing of vegetation for campsites and airfields is likely to be attended by a sudden increase of sunlight breeders, unless special care is taken to minimize the collection of water in small ground depressions. Camps should be policed weekly to eliminate small artificial water holes; larger water holes should be filled, drained or oiled. Along the coast, trapped salt water should be made to flow freely into the sea. Inland swamps, neglected ricefields and irrigation ditches should be drained adequately or sprayed with larvicide. In A. maculatus areas the shading vegetation along streams should not be trimmed.

Typhus

Mite-borne typhus has been reported in Borneo. Mite-infested areas are sago palm and water bamboo swamps, lalang or kunai grasslands along river banks, low scrub jungle along mountain streams, and once-cultivated areas overgrown with scrub. In such terrain, all overgrowth surrounding camp and air-strip facilities should be cleared to the ground. Clothing should be impregnated with G.I. insect repellent each week, and dusted daily with G.I. Insecticidal Powder for Body Crawling Insects.

Flea-borne typhus is common only in urban areas.

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The 37th MSU at Lae commanded by Captain Karl G. Kadner, Sn C, did an interesting experiment during the month of December which is quoted from his report.

"In an effort to determine the effectiveness of atabrine in the suppression of malaria arrangements were made with the Malaria Research Unit (attached to the 3rd Medical Laboratory) to determine urine atabrine levels of all malaria patients entering the 128th Station Hospital. It was hoped that information so derived would enable a better appraisal of the factors responsible for malaria at this base. These tests disclosed that every patient examined had either a negative or very low atabrine level. This information presented to the Unit Commanders provides a reliable basis for corrective action."

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SECRET

Malaria in civilian population of San Carlos (Turac Barrio) as indicated by one-slide blood examination. This work was done by the 442nd Medical Composite Unit (MS) under the command of Captain R. T. Stevenson, Sn C.

Age Grp.	No. Exam.	No. Neg.	% Neg.	No. Pos.	% Pos.	Species Dist.			
						Pv.	Pf.	Pm.	Mixed
1 mth - 6 yrs.	10	8	80.0	2	20.0	2			
7 - 12 yrs.	14	5	35.7	9	64.3	5	3		1 Pv Pf
13 - 20 yrs.	9	2	22.2	7	77.8	2	4		1 Pv Pf
Over 20 yrs.	13	3	23.1	10	76.9	4	5		1 Pv Pf

Spleen Rates in Civilians According to Age Groups:

Age Group	No. Exam.	No. Pos.	% Pos.	Pos. Spleen + Blood
1 mth - 6yrs	10	2	20.0	0
7 - 12 yrs	43 *	12	27.9	6
13 - 20 yrs	13	3	23.1	3
Over 20 yrs.	Not examined (9)			

* Includes 29 pupils, 4 of which had palpable spleens but none of 4 had positive blood smears.

SUMMARY OF ALL INDIVIDUALS EXAMINED

No. Exam.	No. Neg.	% Neg.	No. Pos.	% Pos.	Species Dist.			
					Pv.	Pf.	Pm.	Pv.Pf.
75	46	61.3	29	38.7	13	14	-	3

If all enlarged spleens without positive blood smears are assumed to be due to malaria, then eight (8) more cases may be included in the total malaria rate which would then be (29 + 8) 37 cases, or 49.3%.

Discussion: An unfortunate misunderstanding on the part of our interpreter has invalidated the results by placing marked emphasis on sick and recently sick individuals. The small group of children at Turac Barrio School is more representative but inadequate for the purpose of estimating the malaria situation in Turac Barrio, San Carlos. The school teacher, Mrs. Beata Cayabyab, was quite certain that all the children except one, had not been out of the barrio for the last year. The one which had moved into the area was the only positive case; two other members of his family were also infected with P. falciparum. The only evidence to indicate that local transmission was occurring came from a statement that three boys of one family went out to procure food and returned with chills and fever. Subsequently, the remainder of the family contracted a similar disease. Two of these children were positive for P. falciparum by our survey. However, this is insufficient evidence to incriminate local mosquitoes as vectors of malaria. The only information gained from this survey is the indication that malaria, especially malignant tertian, is prevalent among civilians and may be the source of a military problem should sufficient numbers of poor vectors become infected.

Information: about the entomology of San Carlos Area is extracted from a report made by Captain John G. Franclemont, Sn. C. CO of the 421st Medical Composite Unit (MS).

In the San Carlos Area, three species of Anopheles, barbirostris, pseudobarbirostris and vagus limosus, were found. All collections were made within a mile radius of the camp of the Clearing Company of the 112th Medical Battalion. The first and second species mentioned were found general in pools and along the weedy banks of a slow flowing stream. The last mentioned species was collected in muddy pools. None of the species collected are considered vectors of malaria in the Philippines. Aedes aegypti and an Aedes of the alopictus group were found in an artificial container for water at a Filipino home. Two species of Armigeres were breeding commonly in coconuts.

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A preliminary malaria survey report on findings at San Jose, Mindoro, has been submitted by Captain Edward S. Ross, CO of the 38th MSU. The following is an appraisal of malaria conditions at San Jose based upon preliminary observations:

Description of region: The San Jose area is flat, open country with scattered patches of trees and brush. The locality is surrounded by numerous abandoned sugar cane fields. Due to the very limited rainfall during the present dry season (apparently no rain has fallen during December) very little surface water is present. This is confined to a few small flowing streams and "ox bow" depressions isolated from the main channel of Bugsanga River. The soil and the vegetation of the whole area is very dry.

Mosquito breeding: The following species of Anopheles have been collected to date:

1. Anopheles (Anopheles) hyrcanus nigerrimus
Found in stagnant, grassy ox bows exposed to sun.
2. Anopheles (Anopheles) hyrcanus lesteri
In small, grassy, slowly flowing brook.
3. Anopheles (Myzomyia) vagus limnosus
Same habitat as 2.
4. Anopheles (Myzomyia) annularis
Same habitat as 1.
5. Anopheles (Myzomyia) minimus flavirostris
Small, semi-shaded streams flowing through the town of San Jose.

Of these, minimus is the important malaria vector, hyrcanus and annularis may be regarded as possible or potential vectors. Minimus is apparently one of the most abundant mosquitoes of the area and is found within the San Jose town limits where there are numerous infected Filipinos living near troops.

Local malaria rate: Health records and reports indicate a high rate of infection among the civilians of San Jose. Children showing enlarged spleens are common.

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An example of the wide variety of work being done by control units is given by the following extract from a report by Captain William J. Spicer, Sn C, 97th MCU now on Leyte.

"Adjacent to the City of Jaro the unit discovered a cemetery in which bodies were being buried at the rate of 6 to 10 each day. On investigation we learned that the coffins were covered by only 10 to 12 inches of soil and that the continuous rain washed the newly dug, loose soil, out of the pits and exposing the coffins. Flies were discovered to be breeding prolifically. The unit procured an order from the City Sanitary Inspector, closing the cemetery and proceeded immediately to cut the dense brush out of the burial area, cover the open graves, and oil the entire area with distillate.

The city has now opened a new cemetery and has ordered that all graves be 5 to 6 feet deep."

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ATTENTION:

Due to the many moves made by units during the past few months, it is possible that recent copies of the Newsletter have not been received by all. There is a limited supply of the following newsletters on hand and they will be sent upon request while they last.

Vol. I, No. 11 (Oct); Vol I, No. 12 (Nov); Vol II, No. 1 (Dec); Vol II, No 2 (Jan).

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